

AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

Claim 1 (currently amended) An X-DSL transceiver configured to couple to a ~~communication medium~~ at least one subscriber line to communicate frequency division ~~multiplexed upstream and downstream portions of~~ at least one multi-tone modulated communication channel thereon; and the X-DSL transceiver comprising:

a digital signal processor (DSP) configured to couple to the at least one subscriber line for multi-tone modulation and demodulation of the at least one communication channel thereon, and the DSP operative during a training phase of the at least one multi-tone modulated communication channel to determine an available bandwidth on the at least one subscriber line and to expand or contract a tone spacing of the multi-tone modulation and demodulation of the at least one communication channel responsive to the determination to conform with the available bandwidth on the at least one subscriber line; whereby the tone spacing utilized for modulation and demodulation of the at least one subscriber line vary at least in part based on a length of the at least one subscriber line. ~~configured to select a processing interval inversely corresponding with bandwidth availability on the communication medium for transforming each set of tones associated with the at least one multi-tone modulated communication channel between a time domain and a frequency domain; whereby an initial determination of a relatively high bandwidth availability on the communication medium results in a selection of a relatively shorter processing interval for each tone set and a correspondingly greater number of tone sets processed in a given amount of time, thereby increasing a bandwidth of the multi-tone modulated communication channel by increasing the bandwidth of each individual tone within each set of tones and vice-versa.~~

Claim 2 (currently amended) The X-DSL transceiver of Claim 1, further comprising:

an digital-to-analog converter (DAC) coupled to the ~~communication medium~~ at least one subscriber line and performing a digital-to-analog conversion of the at least one multi-tone modulated communication channel at a fixed sample rate; and

an interpolator coupling the DSP to the DAC, and the interpolator configured to vary an amount of interpolation of the at least one multi-tone modulated communication channel in direct correspondence with the a duration of the a corresponding processing interval selected by the DSP, whereby tone sets processed in the DSP at the relatively shorter duration processing interval will be subject to relatively smaller amounts of interpolation and vice versa, thereby allowing the DAC to maintain the a fixed sample rate.

Claim 3 (currently amended) The X-DSL transceiver of Claim 1, further comprising:

an analog-to-digital converter (ADC) coupled to the ~~communication medium~~ at least one subscriber line and performing a analog-to-digital conversion of the at least one multi-tone modulated communication channel at a fixed sample rate; and

a decimator coupling the ADC and to the DSP, and the decimator configured to vary an amount of decimation of the at least one multi-tone modulated communication channel in direct correspondence with the a duration of the a corresponding processing interval selected by the DSP, whereby tone sets processed in the DSP at the relatively shorter duration processing interval will be subject to relatively smaller amounts of decimation and vice versa, thereby allowing the to maintain the fixed sample rate.

Claim 4 (currently amended) The X-DSL transceiver of Claim 1, wherein the ~~communication medium~~ at least one subscriber line comprises a plurality of subscriber lines; the at least one multi-tone modulated communication channel comprises a plurality of multi-

tone modulated communication channels each associated with a corresponding one of the plurality of subscriber lines; and further comprising:

the DSP configured to independently select for each of the plurality of multi-tone modulated communication channels: a corresponding processing interval which inversely corresponds with the available bandwidth availability on the associated ~~communication medium~~ one of the plurality of subscriber lines.

Claim 5 (currently amended) The X-DSL transceiver of Claim 1, wherein the DSP supports modulation and demodulation of the at least one multi-tone modulated communication channel in a plurality of multi-tone protocols.

Claim 6 (currently amended) The X-DSL transceiver of Claim 1, further comprising:

an digital-to-analog converter (DAC) coupled to the DSP and the ~~communication medium~~ at least one subscriber line and the DAC performing a digital-to-analog conversion of the at least one multi-tone modulated communication channel at a sample rate which corresponds inversely with respect to ~~the~~ a processing interval selected by the DSP; and

an analog-to-digital converter (ADC) coupled to the communication medium and the DSP and the ADC performing an analog-to-digital conversion of the at least one multi-tone modulated communication channel at the sample rate which corresponds inversely with respect to the processing interval selected by the DSP.

Claim 7 (currently amended) The X-DSL transceiver of Claim 1, wherein the at least one ~~communication medium~~ at least one subscriber line comprises a plurality of subscriber lines; the at least one multi-tone modulated communication channel comprises a plurality of multi-tone modulated communication channels each associated with a corresponding one of the plurality of subscriber lines; and further comprising:

the DSP configured to independently select for each of the plurality of multi-tone modulated communication channels a corresponding processing interval which inversely corresponds with the available bandwidth availability on the associated ~~communication medium~~ one of the plurality of subscriber lines; and

a scheduler coupled to the DSP to schedule processing therein of the plurality of multi-tone modulated communication channels based on criteria including the associated processing intervals for each of the plurality of multi-tone modulated communication channels.

Claim 8 (canceled)

Claim 9 (currently amended) The X-DSL transceiver of Claim 1, further comprising:

at least one analog front end (AFE) coupled between the ~~communication medium~~ at least one subscriber line and the DSP and the at least one AFE configured to for performing analog-to-digital and digital-to-analog conversion of the at least one multi-tone modulated communication channel.

10-16. (canceled)

Claim 17 (currently amended) A method in an X-DSL transceiver for communicating at least one multi-tone modulated communication channel across a ~~communication medium~~ subscriber line ; and the method comprising the acts of:

determining during a training phase ~~a bandwidth availability for~~ of the at least one multi-tone modulated communication channel an available bandwidth on the ~~communication medium~~ at least one subscriber line;

selecting a ~~processing interval~~ tone spacing for each successive set of tones associated with the modulation and demodulation of the at least one multi-tone modulated communication channel responsive to based on the available bandwidth availability determined in the determining act; whereby the tone spacing utilized for modulation and demodulation of the at least one subscriber line varies at least in part based on a length of the at least one subscriber line.

~~transforming each successive set of tones in the processing interval selected in the selecting act between a time domain and a frequency domain to demodulate the at least one multi-tone modulated communication channel and vice-versa, whereby the determination in the determining act of a relatively high bandwidth availability on the communication medium results in a selection in the selecting act of a relatively shorter processing interval for each successive set of tones and a correspondingly greater number of tone sets processed in a given amount of time, thereby increasing a bandwidth of the multi-tone modulated communication channel by increasing the bandwidth of each individual tone within each set of tones and vice-versa.~~

Claim 18-20 (canceled)